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Data Communication CS601 Lecture No 5

Lecture Prepared By

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The Internet

- **An internet (note the lowercase i) is two or more networks that can communicate with each other**

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- **The Internet (uppercase I), and is composed of thousands of interconnected networks.**

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Internet History

- **Telegraph and Telephone networks, before 1960:**
  - ✓ **Constant-rate communication only**
  - ✓ **ARPANET- Packet Switched**
- **Birth of the Internet &TCP/IP**
- **MILNET**
- **CSNET**
- **NSFNET**
- **Internet Today**

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What is ARPANET and why is it important?

The Advanced Research Projects Agency (ARPA), an arm of the U.S. Defense Department, funded the development of the Advanced Research Projects Agency Network (ARPANET) in the late 1960s. Its initial purpose was **to link computers at Pentagon-funded research institutions over telephone lines**.

Birth of the Internet &TCP/IP

January 1, 1983 is considered the official birthday of the Internet. Prior to this, the various computer networks did not have a standard way to communicate with each other. A new communications protocol was established called Transfer Control Protocol/Internetwork Protocol (TCP/IP).

MILNET

MILNET was **the name given to a network that split off from ARPANET in 1983 to create an internetwork designated for use by the U.S. Department of Defense**. MILNET later became part of the DoD Defense Network (DDN). MILNET is also known as military net.

Who developed Csnet?

Short for Computer Science Network, CSNET is a computer network that was developed by the **U.S. National Science Foundation** in the early 1980s.

NSFNET

The National Science Foundation Network (NSFNET) was a program of coordinated, evolving projects sponsored by the National Science Foundation (NSF) from 1985 to 1995 to promote advanced research and education networking in the United States.

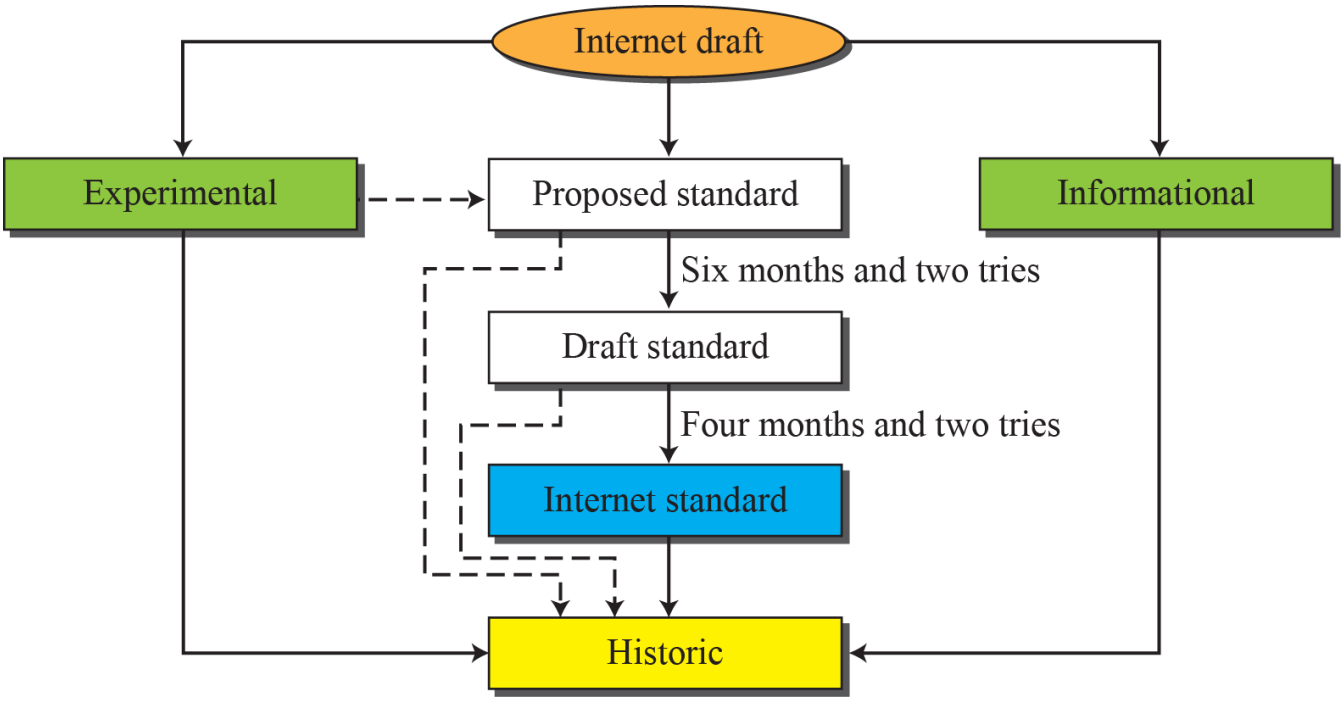
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Internet Standards

- **Internet draft**
- **Request for Comments (RFC)**
  - ✓ **Proposed Standard**
  - ✓ **Draft Standard**
  - ✓ **Internet Standard**
  - ✓ **Historic**
  - ✓ **Experimental**
  - ✓ **Informational**



Protocol Layering - Introduction

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- **Protocol**

Rules that both the sender and receiver and all intermediate devices need to follow to be able to communicate effectively

- **Protocol Layering**

Simple Communication: only one simple protocol

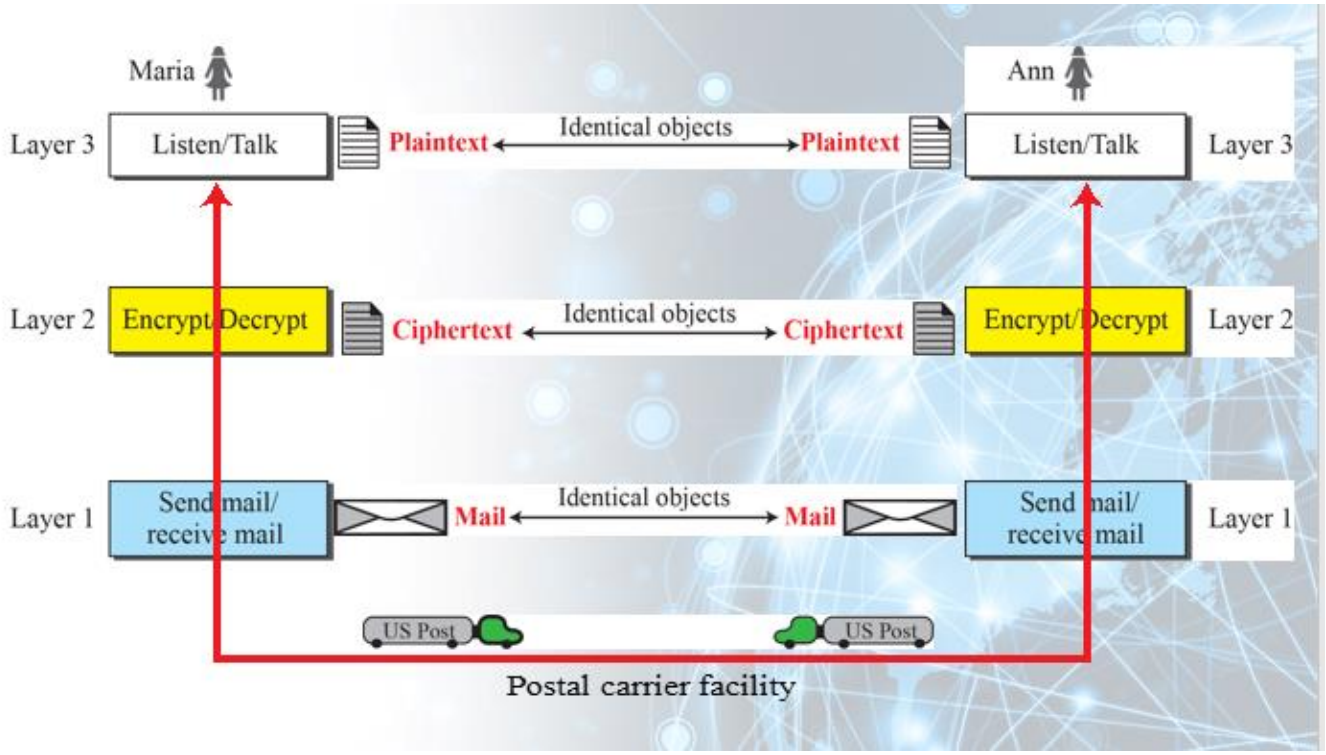


Complex Communication, we need a protocol at each layer, or Protocol Layering

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Protocol Layering - Advantages and Disadvantages

Advantages

- ✓ Modularity
- ✓ Separation of Service & Implementation
- ✓ Reduced Complexity & Cost

Disadvantages

- None Really!

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Protocol Layering - Principles

- **Two Principles**
  - ✓ Bidirectional Communication → Each Layer performs two opposite tasks in each direction
  - ✓ Two objects under each layer at both sites should be identical

Protocol Layering - Logical Connections

- **Logical Connections**
  - ✓ Imaginary connection between each layer

